REMARKS

Claims 1-19 are pending in the present Application.

Claim Rejections – 35 USC § 102

Claims 1, 6-7, 9, 11-17 were rejected under 35 U.S.C. §102(b) as being anticipated by Fitzgerald (U.S. Patent 5,835,361). The Examiner stated:

> "Fitzgerald et al shows, (in, e.g., the(ir) figure 1 and corresponding disclosure)
>
> As to claim 1;
>
> A converter-controller, operable to control a converter having a transformer (L1/L2), the transformer having a primary (L1) and a secondary coil (L2), the converter-controller comprising: a power device (Q3), coupled to the primary coil of the transformer; a resonant circuit (C6 and L1, see, e.g., column 2 lines 13-21), coupled to the primary coil and the power device; a voltage regulator (D6, R11/R12 etc.), coupled to the resonant circuit; and a control logic (including 23, IC1, Q2, etc.) coupled to the voltage regulator a control logic, coupled to the voltage regulator, wherein the control logic is configures to operate the power device at an essentially constant frequency by varying the length of switch-on and switch-ff intervals of the power device (this is called pulse width modulation –Q2 is described as a duty cycle modulator at column 5 lines 36-44)."

Applicant respectfully traverses the rejection at least for the following reasons.

(i) Fitzgerald does not have a "resonant circuit coupled to the primary coil". The Examiner identified L1, the primary coil as the coil of the alleged resonant circuit in Fitzgerald. In contrast, claim 1 recites that the resonant circuit, including the coil of the resonant circuit, is separate from the primary coil, since it is coupled to it. If the resonant circuit were not separate from the primary coil, it could not have been "coupled to" it.

In the present application, in the embodiment described in FIG. 1 "resonant inductor L1" is the coil of resonant circuit 104. Resonant inductor L1 is visibly separate from primary winding N1. The difference between the coils is considerable: in typical applications the physical parameters of resonant inductor L1 are quite different from that of the primary winding N1, since resonant inductor L1 is only needed for performing control functions and

not power functions. For example, in typical applications the inductance of the primary windings N1 is of the order of a milli-Henry, whereas that of resonant inductor L1 of claim 1 can be in the range of a micro-Henry.

The importance of this distinction can be further appreciated by noting that Fitzgerald used his resonant circuit to reduce the switching losses of power transistor Q3. This function was best served by making the primary winding part of the resonant circuit. In contrast, the resonant circuit of claim 1 is designed to provide the operating voltage for the control circuit in a lossless manner. Given the order of magnitude difference of the currents involved, it is important that the resonant circuit of claim 1 is separate from the primary winding.

Thus, Fitzgerald does not have a "resonant circuit coupled to the primary coil". At least for this reason, Fitzgerald does not anticipate claim 1. Therefore, claim 1 has been shown to be allowable and allowance of claim 1 is hereby respectfully requested.

(ii) Fitzgerald does not have a "voltage regulator". The voltage regulator's function is described e.g. in paragraph [0039] of the specification: the voltage regulator "generates a required operating voltage" for the control circuit.

The Examiner identified diode D6 and resistor R11 and R12 as the voltage regulator in Fitzgerald. However, diode D6 is coupled parallel to power device Q3. It is described by Fitzgerald as a "damper diode." The function of the damper diode is clearly stated as (col. 3, l. 60-62):

> "At time t3 of FIG. 2b, voltage VD is close to zero volts and slightly negative, causing damper diode D6 of FIG. 1 to turn on and to clamp voltage VD of FIG. 2b to approximately zero volts. Thus, resonant circuit 21 of FIG. 1 exhibits a half cycle of oscillation."

Fitzgerald does not mention anything about "generating a required operating voltage" for the control circuit whatsoever: the function of damper diode D6 is completely different.

As described in the above quote, the function of damper diode D6 is to contribute to the generation of the half-cycle type operation of the circuit. As such, damper diode D6 is

closest related to resonant diode D2 of the present application. The function of resonant diode D2 is described as (paragraph [0035]):

> "The time instance *t2* is approximately the half-period of resonant circuit 104, therefore, at *t2* resonant current *ic* would change sense. However, resonant diode D2 prevents *ic* from turning negative."

A function of resonant diode D2 is also to contribute to the generation of the half-cycle type operation of the circuit, the closest analog of damper diode D6 of Fitzgerald.

However, tellingly, resonant diode D2 is not part of voltage regulator 108. It is diode D3 which is part of voltage regulator 108, "rectifying central node voltage Va" (paragraph [0039]). No element has been identified by the Examiner, corresponding to diode D3 – or any other elements - of voltage regulator 108.

Thus, the function of damper diode D6 in Fitzgerald is completely different from and not related to "generating a required operating voltage". Therefore, damper diode D6 is not part of any voltage regulator. Since resistors R11 and R12 are only passive elements, they are not part of a proper voltage regulator either.

In sum, Fitzgerald does not have a "voltage regulator". At least for this reason, Fitzgerald does not anticipate claim 1. Therefore, claim 1 has been shown to be allowable and allowance of claim 1 is hereby respectfully requested.

(iii) Fitzgerald does not describe "operat[ing] the power device at an essentially constant frequency". Fitzgerald does not use the term "frequency" anywhere in his patent. The Examiner simply pointed at transistor Q2, described as being part of a "duty cycle modulator". It is implied that duty cycle modulators inherently operate at an essentially constant frequency. In contrast, there are numerous US patents, which describe duty cycle modulators, which operate at variable frequencies. Therefore, without explicit disclosure, an "essentially constant frequency" is not inherent in Fitzgerald.

In sum, Fitzgerald does not describe "operat[ing] the power device at an essentially constant frequency". At least for this reason, Fitzgerald does not anticipate claim 1. Therefore, claim 1 has been shown to be allowable and allowance of claim 1 is hereby respectfully requested.

Claims 6, 7, 9, 11, and 12 were rejected by the Examiner. Claims 6, 7, 9, 11, and 12 depend from independent claim 1. Independent claim 1 has been shown to be allowable. Therefore, at least for this reason, claims 6, 7, 9, 11, and 12 are also allowable and their allowance is hereby respectfully requested.

Claims 13-15 were rejected because the Examiner stated that the prior art device of Fitzgerald "in its normal and usual operation, would necessarily perform the method claimed".

Applicant respectfully traverses the rejection.

As shown above, Fitzgerald does not have several limitations of the device of the present Application. The missing limitations include a "resonant circuit coupled to the primary coil" a "voltage regulator", and "operating the power device at an essentially constant frequency".

Since these limitations are missing in Fitzgerald, it cannot and does not inherently perform the method of claim 13.

Moreover, Fitzgerald provides an over-current protection for the power transistor Q3 and not for any alleged controller. Therefore, the "normal and usual operation" of Fitzgerald's circuit is very different from that of the present Application, and thus, Fitzgerald's device would not "necessarily perform the method claimed".

Claims 14 and 15 depend from independent claim 13, which has been shown to be allowable. Therefore, claims 14 and 15 are allowable at least for this reason.

Claims 16 and 17 were rejected under 35 U.S.C. §102(b) as being anticipated by Fitzgerald (U.S. Patent 5,835,361). The Examiner stated:

> "the clamping is part of the over-current protection circuit which clamps the operating voltage of the control logic"

Applicant respectfully traverses the rejection for at least the following reasons.

(i) Fitzgerald does not describe "an operating voltage of the control logic is clamped". First, clamping is not inherently part of an over-current protection circuit. The Examiner stated that "clamping is part of the over-current protection". As explained in the Response to the First Office Action, not all protection circuits clamp an operating voltage. For example, the resonant circuit of Shimizu contains his capacitor 204 and inductor 206 in parallel. Such resonant circuits do not clamp the operating voltage. However, resonant circuits which have the inductor and capacitor in series – like the resonant circuits of claim 1 and 16 - do clamp the operating voltage. Therefore, this limitation is by no means inherent. Since the Examiner did not point to any particular waveform, or signal, in Fitzgerald which would be clamped, this limitation was not shown to be present in Fitzgerald.

Second, Fitzgerald described an over-current protection circuit for the power transistor (e.g. in the Abstract):

> "An over-current protection circuit disables the transistor switch when an over-current condition persist longer than a first interval that is substantially longer than a period of a given current pulse in the transistor switch." (emphasis added)

In contrast, Applicant's circuit is concerned with providing protection for the control logic (paragraph[0001]):

> "The present invention relates to control circuits of converters and more particularly to lossless resonant circuits for providing a low operating voltage for control circuits."

Since the protection function is provided for entirely different circuit blocks by Fitzgerald and by the present Application, even if clamping were "part of the over-current protection" for Fitzgerald's circuit, even then this feature would not carry over for the entirely different function the present Application. Therefore, there is no explicit or implicit disclosure of a voltage clamping in Fitzgerald.

Finally, the only description of "clamping" a voltage in Fitzgerald is at (col. 3, l. 60):

> "At time t3 of FIG. 2b, voltage VD is close to zero volts and slightly negative, causing damper diode D6 of FIG. 1 to turn on and to clamp voltage VD of FIG. 2b to approximately zero volts."

However, FIG. 2b shows that in the other half cycle VD is of the order of 500V, certainly not a low or clamped value.

In sum, Fitzgerald does not describe "an operating voltage of the control logic is clamped". At least for this reason, Fitzgerald does not anticipate claim 16. Therefore, claim 16 has been shown to be allowable and allowance of claim 16 is hereby respectfully requested.

Further, as described above in more detail:

(ii) Fitzgerald does not have a "resonant circuit coupled to the primary coil". The Examiner identified L1, the primary coil as the coil of the resonant circuit. In contrast, claim 1 recites that the resonant circuit, including the coil of the resonant circuit, is separate from the primary coil, since it is coupled to it. If the resonant circuit were not separate, it could not have been coupled to the primary coil.

Thus, Fitzgerald does not have a "resonant circuit coupled to the primary coil". At least for this reason, Fitzgerald does not anticipate claim 16. Therefore, claim 16 has been shown to be allowable and allowance of claim 16 is hereby respectfully requested.

(iii) Fitzgerald does not have a "voltage regulator". The voltage regulator's function is described e.g. in paragraph [0039] of the specification: the voltage regulator "generates a required operating voltage" for the control circuit.

The Examiner identified diode D6 and resistor R11 and R12 as the voltage regulator in Fitzgerald. However, diode D6 is coupled parallel to power device Q3. It is described by Fitzgerald as a "damper diode." The function of damper diode D6 is completely different from "generating a required operating voltage."

In sum, Fitzgerald does not have a "voltage regulator". At least for this reason, Fitzgerald does not anticipate claim 16. Therefore, claim 16 has been shown to be allowable and allowance of claim 16 is hereby respectfully requested.

At least for all the above reasons, claim 16 is not anticipated by Fitzgerald. Therefore, claim 16 has been shown to be allowable and allowance of claim 16 is hereby respectfully requested.

Claim 17 was rejected by the Examiner. Claim 17 depends from independent claim 16, which has been shown to be allowable. Therefore, claim 17 is allowable at least for this reason as well.

Allowable Subject Matter

Claims 2-5, 8, 10, and 18-19 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In response, Applicant respectfully states that the patentability of independent claims 1, 14 and 16 has been shown above. Therefore, if the patentability of these independent claims is confirmed by the Patent and Trademark Office, then the allowable dependent claims need not be rewritten in independent form. However, if the patentability of the above independent claims is not confirmed, Applicant is prepared to rewrite the allowable claims in independent form.

CONCLUSION

Applicant respectfully requests that the pending claims be allowed and the case passed to issue. Should the Examiner wish to discuss the Application, it is requested that the Examiner contact the undersigned at (415) 772-7434.

Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

2/7/06 Richard A. Pasic

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Respectfully submitted,

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